BOULDER CREEK
NEIGHBORHOODS

8/14/2020

Board of Directors
Superior Metropolitan District No. 1
124 E. Coal Creek Drive
Superior, CO 80027

RE: Rogers Farm – wee-Cottage system development fees exemption request

Dear Board Members:

Boulder Creek Neighborhoods (BCN) requests an exemption from the system development fees for the wee-Cottage product proposed for the Rogers Farm neighborhood. We propose that the wee-Cottage single-family detached homes (Cottage Homes) be considered *Multi-family Residential Units*, as currently defined per the Superior Metropolitan District Rules and Regulations (District Rules & Regs) as follows:

Apartments, condominiums, townhouses and similar facilities in the same complex; all units intended for long-term rental or ownership.

The detached Cottage Homes, ranging from 900 -1,550 sq. ft., are of similar size, bedroom count, and household size as multifamily condominium and apartments units, and they are smaller than the typical townhome unit. The typical square footage of the most common Cottage Home plans at Rogers Farm are 1,136 - 1,380 sq. ft., with 2-3 bedrooms and 2.5 bathrooms. Approximately 2.2 people live in Cottage Homes based on survey data from previous BCN communities. Cottage Homes appeal mostly to singles and couples looking to downsize and simplify their lives in a low maintenance home. With on-lot, outdoor irrigation use limited to a small front yard area of less than 300 sq. ft., we anticipate the Cottage Homes at Rogers Farm to use 90% less irrigation water and 40-60% less indoor water use than the average single-family detached home. We derived this conclusion from the attached *Water Use Analysis* by Hines, Inc., a Northern Colorado-based company specializing in water asset management and water conservation throughout the southwest.

The District Rules & Regs establish an Equivalent Residential Unit (EQR) Schedule for setting of fees, the rationale stated as “the base for this schedule is an average detached single-family residence, or its equivalent.” Clearly the Cottage Homes, at an average home size of 1,250 sf, are significantly smaller than the average detached single-family residence. Thus, we feel the request for a Cottage Home to receive a multifamily and appropriate EQR categorization based on bedrooms and bathrooms is fully justified.

BACKGROUND AND RATIONALE

At the heart of this request is to propose that system development fees are equitably applied to the appropriate housing type. In this case, the *detached* Cottage Homes would be charged the same water, sewer, and storm system development fees as *attached* residential home types of similar square footage, bedroom and bathroom counts, corresponding persons/household, and lot size.

Over the past 10 years, home types have rapidly evolved. The conventional notions of a detached home being the largest home type and townhomes/condos/duplexes/apartments being the smallest home types are now being challenged. Current Front Range municipal tap fee structures still rely on assumptions that single-family detached homes generally use more water than attached and multifamily housing types. Thus, most municipalities typically offer some sort of tiered tap fee structure, charging higher tap fees to detached homes than attached and multifamily homes. This acknowledges that homes using more water and creating more effluent and storm runoff should pay higher fees due to a greater impact on municipal utility systems. This tiered tap fee structure encourages multifamily and attached housing types to be built, as there is a direct correlation between tap fees/impact fees, home/unit size, and price points.

Over the past 30-40 years, condominiums and townhomes have increasingly provided the market rate attainable housing options in Colorado. However, construction defect laws in Colorado have virtually extinguished for-sale multifamily housing, thus severely restricting the supply of market rate attainable housing.

Small detached Cottage Homes offer a solution to this severe shortage of smaller home types. 81% of people want to buy a single-family home (Zillow Group Consumer Housing Trends Report, 2018). Because the Cottage Home size is similar or smaller than typical townhomes and condos, they should be categorized as multifamily/attached and receive the residential equivalent based on bedrooms and bathrooms.

WATER USE ANALYSIS

A Cottage Home lot is much smaller than a typical lot in Superior, so we engaged Hines, Inc. to perform a water use analysis comparing a Cottage Home to a typical single-family detached home in Superior. We used a typical home in Rock Creek Ranch, assuming the following:

- 6,000 - 7,000 sf lot (home size variable 2,500 – 6,000 sf)
- 3,500 sf of turf in a manicured back yard and front yard
- 3+ people living in the home, 4+ bedrooms and 4+ bathrooms

Results of this analysis estimate the following water usage for the typical single-family detached home:

- 58,000 gallons per year in outdoor water use
- 66,000 – 110,000 gallons per year indoor water use

By comparison, Cottage Homes have very limited outdoor water use. Irrigation can consume about 50% of household water use. The Cottage Homes use virtually no outdoor water, as there is only about 300 sq. ft. of irrigable area in the front of the home.

Assumptions utilized for the Cottage Homes include:

- 1,600 – 2,200 sf lot (home size average 1,250 sf)
- 300 sf front yard area and little or no area for turf
- 2.2 people living in the home, 2-3 bedrooms and 2.5 bathrooms

Results of this analysis estimate the following water usage for the Cottage home:

- 5,000 gallons per year in outdoor water use
- 39,000 gallons per year indoor water use

This results in a Cottage Home using up to 90% less irrigation water and up to 40-60% less indoor water than a typical suburban home previously described.

CASE STUDY #1

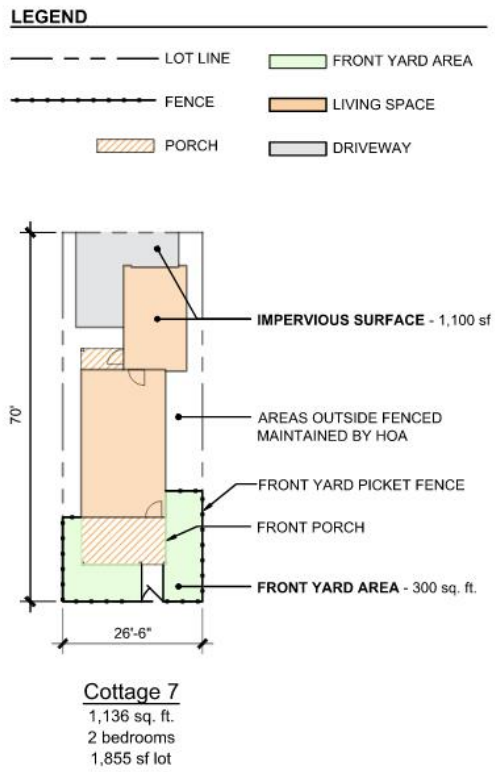


Figure 1 - Cottage Home lot

Figure 2 – Rock Creek Ranch lot

- 1,855 sq. ft. lot; 1,136 sq. ft. home
- 300 sq. ft. yard area
- 1,100 sq. ft. impervious area

- 8,500 sq. ft. lot; 3,276 sq. ft. home
- 4,000 sq. ft. yard area, mostly turf
- 4,000 sq. ft. impervious area

Note: In the above example, the Cottage Home would pay the same system development fees as the Rock Creek Ranch home for water, sewer, and storm system development fees under current District rules & regulations. The two homes above are shown at the same scale.

This data suggests that a Cottage Home uses about a 70-75% less water overall (indoor and outdoor) than a typical home but would pay the same system development fees. This structure in inequitable and only results in a higher-priced home, slower sales and absorptions, or it leads to more homes being paired for financial reasons and not meeting what the market is demanding: a detached, attainably priced home.

FEE SUMMARY AND IMPACT ON HOME PRICES

Below is a sample of the fee structure of an *attached* Cottage Home as compared to a *detached* Cottage Home, with all relevant aspects of the home the same (1,300 sf home, 2 bedrooms, 2.5 bathrooms).

	Detached	**Attached**
Building Permit Fees	$7,555	$7,555
(Permit Fee, Plan Review, Use Tax, County Tax)		
Water & Sewer Tap Fee	$580	$580
Water System Development Fee	*$24,808*	*$17,367*
Sewer System Development Fee	*$5,043*	*$4,539*
Storm System Development Fee	*$3,170*	*$2,219*
Park Development Fee	$3,000	$3,000
TOTAL	**$44,156**	**$35,260**

At Rogers Farm, the water, sewer and storm system development fees average around $9,000 higher for a *detached* home as compared to the exact same *attached* home.

Every dollar of the cost of the home generally translates to some required increase in sales prices. The lower the price of the home, the more impact every dollar in cost has. Thus, the current system development fee structure disincentivizes building smaller detached homes.

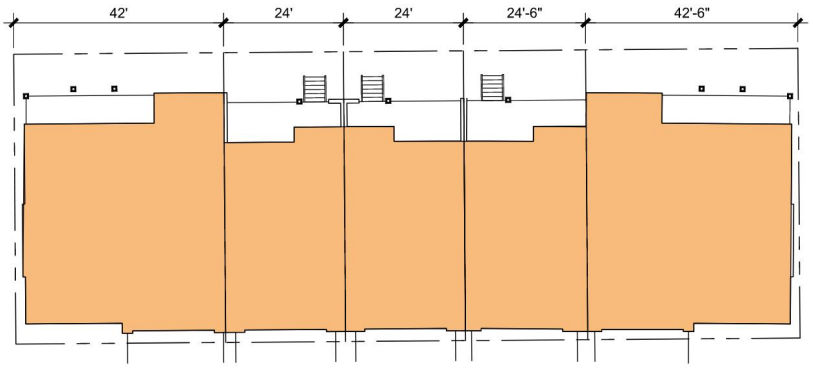
FEES AS PERCENT OF HOME VALUE

Once building permit fees exceed 8-10% of the projected sales price of the home, residential projects generally become unfeasible, assuming there is a market ceiling on home price. In Case Study #1, the building permit fee would represent about 6% of the Rock Creek home value, while it would represent about 10-13% of the Cottage Home, depending upon the market.

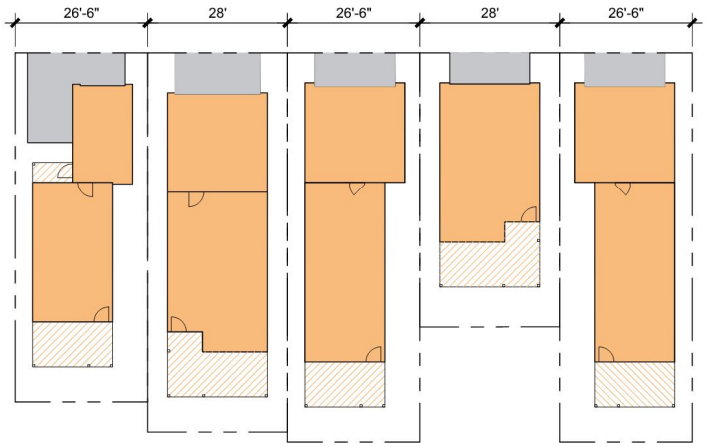
This generally results in more expensive, larger homes offered to make projects financially feasible, leading to a phenomenon referred to as “Missing Middle” housing. Over the decades, Missing Middle housing, a fundamental building block in the mid-20th century, has been abandoned by developers in lieu of large single-family houses or high-density apartments, creating a mismatch between available housing stock and affordability.

Please see **Case Study #2** below for a comparison of 5 wee-Cottage homes as compared to a 5-plex townhome building. Even though the 5-plex townhome building has about double the square footage, similar # of bedrooms, and significantly more impervious area than the 5 Cottage Homes, the Cottage Homes will be charged about $10,000/house more per unit than the townhomes for water, sewer, and stormwater system development fees.

CASE STUDY #2



Boulder Creek yourHouse Townhomes
5 units, 11,250 sq. ft total; 10-14 bedrooms



wee-Cottage Detached Homes
5 homes, 6,750 sq. ft. total, 11-14 bedrooms

Note: In the above example, the five Cottage Homes would pay approximately $52,000 more than the 5-plex townhome building for system development fees (assume (2) 2-BDR & (3) 3-BDR townhomes). Both examples have similar small fenced private front yard areas with limited irrigation.

Below is a summary of the square footage and lot sizes proposed at Rogers Farm for reference:

	Home Size	Bedrooms	Bathrooms
Cottage 1:	896 sf	2	2.5
Cottage 2:	1,304 sf	2	2.5
Cottage 5:	1,380 sf	2-3	2.5
Cottage 7:	1,136	2	2.5
Cottage 8:	1,536	3	2.5

Lot sizes: Range from 1,540 – 2,300 sf

We propose that the Board of Directors consider creation of a policy, or allow an exception, to allow a categorization of *Small Detached Homes* that are:

- under 1,600 sq. ft. of habitable living space
- 3 bedrooms or less
- lots less than 3,000 sq. ft. in size
- Less than 500 sq. ft. of on-lot, irrigable private yard landscape area

The justification is that detached homes of this size and lot configuration will likely consist of 3 or less people/household, extremely limited irrigation use, potentially half the indoor water use, and significantly less impervious surface than that of a typical single-family detached home/lot. Home designs are ever evolving, and water, sewer, storm and impact fee structures need to be adapted to encourage a diversity of housing types and encourage market rate attainable housing.

Thank you for your consideration and would appreciate the opportunity for your feedback in finding a solution for a more equitable system development fee structure.

Sincerely,

Mike Cooper
Boulder Creek Neighborhoods

Attachments: Water Use Analysis Memo (Hines, Inc.)

Colorado Water Planning and Analysis Per Capita Water Use Research and Identification (Hines, Inc.)

Hines Inc

July 8, 2020

Mr. Mike Cooper
BOULDER CREEK NEIGHBORHOOD
712 Main Street
Louisville, CO 80027

Mr. Cooper,

Hines has completed an analysis of the estimated water use for the Wee Cottage Series floor plans provided by your office for the proposed development. This includes a review of the estimated exterior irrigation estimates for the Wee Cottage compared to a 'typical' residential home & a review of likely interior water use. The interior water use analysis was conducted using fixture count, typical resident count per unit, & a water savings estimate for Standard vs Efficient water use.

Exterior Landscape Irrigation Water Use Analysis

Based on information provided by the Client, Hines has developed an opinion of estimated landscape water use for a standard 7,000 SF lot provided by your office.

- 3,600SF of landscape area
- 50% blue grass sod, 50% drip irrigated plant materials
- The per lot water requirement is estimated to be 0.18 acre-feet per year (approximately 58,000 gallons)

Sample Lot 50% BG/50% Drip		
# of Lots	Acre/Ft per lot	Total
1	0.185	0.18
10	0.185	1.85
100	0.185	18.48

The Wee Cottage estimated landscape water for a standard 2,000SF lot is as follows:

- 300 SF of landscape area
- 50% fescue grass, 50% drip irrigated plant materials
- The per lot water requirement is estimated to be 0.02 acre-feet per year (approximately 5,000 gallons)

Wee Cottage 50% FB/50% Drip		
# of Lots	Acre/Ft per lot	Total
1	0.015	0.02
10	0.015	0.15
100	0.015	1.54

Interior Water Use Analysis

Please refer to the State of Colorado Interior Water Use report provided by our office in assessing likely, typical residential interior water use. For the purposes of this discussion, we are assuming a

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Arizona Office: 1110 E. Missouri Avenue, Suite 380, Phoenix, Arizona 85014 / Phone: 602.240.9800 / Fax: 602.240.9890
National: 800.295.0807

typical, comparative home, located on the 7,000 SF lot discussed above, to meet the following minimum characteristics:

- 3,500SF home
- 3 full-time occupants

The likely interior water use for this typical home may range from 60 gallons per occupant per day, based on state water use data, to 100 gallons per occupant per day, which reflects historic understandings of interior water use. *This would indicate a total, interior, annual water use requirement of 65,700 gallons (0.2 acre-feet) to 109,500 gallons (0.33 acre-feet) per typical home.*

The Wee Cottage Interior water use estimates indicate a significant reduction due to both increased efficiency built into each home & reduced occupant count. Although, Boulder Creek Neighborhoods constructs eight different styles of Cottage, which may attract different occupant levels, we have assumed 2.2 occupants across all floor plans for ease of discussion.

Based on the plans provided, Table 1 contains a supply fixture count, fixture water use and quantity in standard types of 2 & 3 bedroom units. It is assumed that all Wee Cottage homes are built with WaterSense/Energy Star fixtures.

Table 1 – Fixture count and water use

Fixture Type	2-Bed Unit	3-Bed Unit	Standard Water Use (GPM)	Water Sense Water Use (GPM)
Faucets	4	5	2.2	2.56
Toilets	3	3	1.6	16
Shower/Bath	2	3	2.5	0.86
Dishwasher	1	1	6 gal/cycle	4 gal/cycle
Clothes Washer	1	1	20 gal/cycle	14 gal/cycle

Occupancy statistics of previous developments completed by Boulder Creek Neighborhoods indicate that a conservative assumption of 2.2 residents per dwelling unit is warranted for this study.

- A *normal occupant* uses water at an average rate. They fix leaks, but do not consciously make an effort to conserve water or adopt water conservation methods. The largest impact to their water use relies on the fixtures installed in their home.
- An *efficient* occupant is conscious of their water use and adopts methods to reduce water use. In addition to installing high efficiency fixtures and appliances they also limit shower times, only run appliances when full, collect cold water when running faucets, showers and baths for other uses around the house and actively track their water use.

PER PERSON/DAY WATER USE BASED ON FIXTURES, USE AND OCCUPANTS

Table 2 contains typical daily water use activities, frequencies and water use per occupant. These numbers are based on all units having WaterSense/Energy Star rated fixtures and appliances. The difference in the calculations is a comparison of a Normal Occupant versus an Efficient Occupant with the same rated fixtures.

Based on conservation efforts, surveys taken by water utilities in Colorado and water use data approximately 40% of users currently are efficient water users. To model water use more accurately water use between the normal water user and efficient water user are provided below.

In the months of October through April a seasonal dip to the average water use occurs. These months typically use 15% less water than May through September based on available usage data.

Table 2 – Water use per day per occupant

Activity	Frequency	Normal Occupant (Gallons)	Efficient Occupant Gallons)	Normal Daily Total (Gallons)	Efficient Daily Total (Gallons)
Toilet Flushing	2	1.28	1.28	2.56	2.56
Shower	1	16	10	16	10
Bath	1	45	30	6.43	4.29
Handwashing	4	1	0.5	4	2
Teeth Brushing	2	2	0.5	4	1
Cooking	2	2	1	4	2
Dishwasher	1	12	4	12	4
Laundry	2	16	14	4.57	4
Miscellaneous	1	4	2	4	2
TOTALS				57.56	34.4

Table 2 Notes:

1. The use amounts for bathing have been expressed as weekly and have been adjusted by dividing 7 to derive daily water use amounts.
2. The use amount for dishwater use for the Normal Occupant assumes standard cycle and pre-rinse setting use. The efficient occupant uses a shorter wash cycle & scrapes food from dishes.
3. The laundry frequency is derived from 300 average laundry loads per year for a family of four. The Normal Occupant uses a cycle which fills the machine automatically, the efficient occupant adjusts the water level for each load.
4. The miscellaneous category includes water used for general clean up, drinking, watering indoor plants, & related ancillary uses.

Table 3 provides the daily estimated water use for the Cottage floor plans current developed by Boulder Creek Neighborhoods.

Table 3 – Wee Cottage 2 & 3 bed units

Occupant Type	# of persons	Daily Water Use	Annual Water Use (Gal)	Annual Acre Feet (AF)
Normal	2.2	126.6	46,221	0.14
Efficient	2.2	75.68	27,623	0.08
Average	2.2	106.3	38,782	0.12

Analysis Summary

When comparing the likely water consumption of the Wee Cottage with a typical residential home in the study area, we find that the Wee Cottage will *utilize 90% less water for exterior irrigation* and *40% - 60% less water for interior uses* when compared to a standard residential unit.

Colorado Water Planning and Analysis
Per Capita Water Use Research and Identification

July 2020
By
Nate Hines, President, Hines, Inc.
Edward Wranosky, Project Engineer, Hines, Inc.

BACKGROUND

Exceedingly high raw water costs have made it increasingly difficult to develop new properties along the Front Range of Colorado. The cost of raw water shares, which must be purchased and dedicated to the potable water provider, has risen to historic highs & threatens to price out many development projects & nearly eliminate housing affordability.

It is common for a municipality or water provider to require the developer to dedicate shares of water to meet future water needs of a dwelling unit. Many Front Range water providers require a percentage of an acre foot of water for each dwelling unit. Often up to one full acre foot of water is required. The price of water can vary depending on the quality and type of water share presented, however the average cost typically ranges from $50,000 to $80,000 per acre foot. Just 10 years ago the average share price was less than $10,000.

This exponential increase in price for water per housing unit has driven this research into the underlying water dedication assumptions to verify there is a reasonable match between water dedication requirements and actual dwelling unit water use.

The following data and study information indicates the following:

- Historic raw water dedication requirements are extraordinarily high when compared to actual use in dwelling units
- Hines presents data gathered from several state & national sources, from several Colorado communities providing year over year water use data, & a model water efficiency community
- Additionally, Hines has compiled an Actual Water Use Case Study based on User Count, Fixture, & Dwelling Unit size which clearly validates the study information presented above
- Water use cases have been presented as Standard, Efficient users for ease of comparison
- The baseline comparison calculation is gallons per person per day

WATER USE SUMMARY

Dwelling unit size and the number of inhabitants impacts total residential dwelling unit water use. Historically, water use is based on the number of bedrooms per housing unit. This water use assumption is evident in the equation for sizing septic systems for rural homes without sanitary sewer availability. This same formula basing water use on the bedrooms per dwelling unit is translated into inhabitants for residential homes served by potable water systems and public sanitary sewer.

One Acre Foot of water yields 325,850 gallons. If we assume one-acre foot of water required per dwelling unit, this equates to 890 gallons per day available for residential water use. A three-bed dwelling unit with 2 residents would have access to 445 gallons per day per resident. A two-bed dwelling unit with 1.5 residents could potentially utilize 590 gallons per person per day.

EVALUATION

HISTORIC WATER USE ESTIMATE CALCULATIONS

An indoor water use estimate popularized in the 1970's by the American Society of Civil Engineers[1] project engineers and surveys of household water use is estimated 120 gallons per person per day. This estimate of use is still used today to determine water requirements per dwelling unit. USGS has published significant data[2] indicating an historic average use of 80-100 gallons per person per day. The U.S. Census Bureau reports that the average Colorado residence is 2.49 persons per home[3], this would yield a total residential daily water use of 300 gallons per day – equivalent to 1/3rd of an acre-foot and often well below the required water dedication.

CURRENT WATER USE ESTIMATE CALCULATIONS

Per capita water use has been dropping precipitously the past 50 years due to increasingly efficient water use fixtures, a reduction in total persons per home, & other domestic trends such as an increase in dual person working families. Current national studies[4] indicate that standard household daily water use is 126 gallons per day. Assuming household with 2.49 persons, this indicates the standard water user utilizes 50 gallons of water use per person per day.

This is supported by Colorado specific water use information. Denver Water[5], following an extensive review of residential water use has set a moderate efficiency target for each resident of 40 gallons per person per day. It is important to note that this represents an expected efficiency achieved through the use of WaterSense[6] fixtures in homes.

Hines has reviewed year over year data compiled by several Front Range communities which indicate the daily per person interior water use ranges of 30 gallons/day – 60 gallons/day (note the larger range includes exterior landscape irrigation).

In examining an existing subdivision built in 2015, the Revive Community, in North Fort Collins provides data for an Efficiency Water Use case study. The community consists of townhomes with an average of 2 bedrooms & 2 bathrooms per unit. Larger duplex units include 2 or 3 bedrooms and 4 baths. All units have been fitted and maintained with EPA Certified WaterSense fixtures. Multiple year analysis[7] of this development indicates:

- Townhome daily water use of 29 gallons per day per resident
- Duplex daily water use of 35 gallons per day per resident

PROPOSED WATER USE MODIFICATIONS

Below is a summary of typical of residential units which could be served by one acre foot of water based on data presented above.

Average or Larger Dwelling Unit Water Use Estimate

- **60** gallons per person per day
- **1.5** residents per dwelling unit
- **90** gallons per day
- **32,850** gallons per year
- **10** residential units per Acre Foot

Efficient or Small Dwelling Unit Water Use Estimate

- **40** gallons per person per day
- **1.5** residents per dwelling unit
- **60** gallons per day
- **21,900** gallons per year
- **14** residential units per share CBT

Please note that residential unit usage may change based on both efficiency metrics and size of dwelling unit.

RECOMMENDATION

Based on the information presented above, it is clear that many, current raw water dedication requirements far exceed actual usage rates. They increase the expense of development and in many cases are cost prohibitive. This directly effects the affordability of housing on the Front Range of Colorado. Depending on the raw water dedication requirements of the subject municipality or water provider, a significant reduction may be available which would reduce overall costs for each home, identify water conservation opportunities, & earmark said waters for future use, population expansion, or drought preparation.

References:

Hines, Inc., 323 West Drake Road, Suite 204, Fort Collins, CO 80526

1. *ASCE – Manuals and Reports on Engineering Practice – No.37 (WPCF Manual of Practice No.9), Printed 1970, Headquarters of the Society, 345 East 47th Street, New York, New York, 10017*
2. *https://www.usgs.gov/special-topic/water-science-school/science/water-qa-how-much-water-do-i-use-home-each-day?qt-science_center_objects=0#qt-science_center_objects*
3. *https://www.census.gov/newsroom/releases/archives/2010_census/cb11-cn139.html#:~:text=The_average_household_size_was,30.3_percent_that_were_rented.*
4. *https://www.awwa.org/Portals/0/AWWA/ETS/Resources/WaterConservationResidential_End_Uses_of_Water.pdf?ver=2016-04-14-14-135024-200*
5. *https://www.denverwater.org/sites/default/files/water-efficiency-plan.pdf*
6. *https://wwwhttps://www.epa.gov/watersense/watersense-products.*
7. *Information provided by Revive community management*